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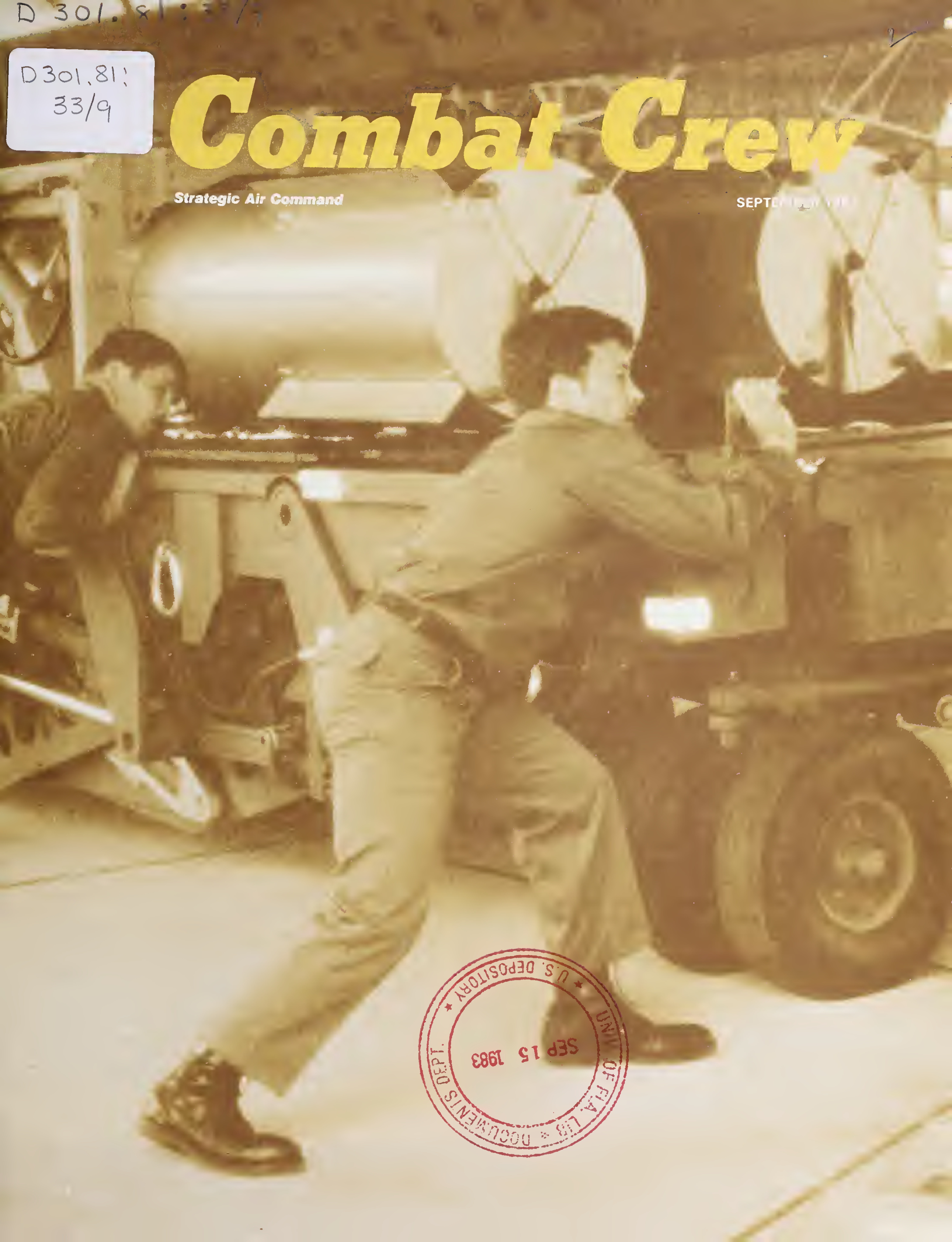
Combat Crew

Strategic Air Command

SEPTEMBER 1983



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Combat Crew

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On Our Cover

Combat Crew salutes the hard working people who will participate in the 1983 SAC Combat Weapons Loading Competition.

SACRP 127-1 VOL. XXXIII NO. 9 SEPTEMBER 1983

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YOU...The F

The increasing complexity of the international environment presents numerous challenges for the United States, its armed forces and for the Strategic Air Command. In an era of steady growth of Soviet military forces, a questioning of traditional regional alliances and a growing demand for scarce natural resources, we must work diligently to maintain the military capability to provide for the defense of the American people and support of our allies.

The most crucial area of concern to the Strategic Air Command is our strategic nuclear deterrent capability. Through extensive modification of existing weapon systems and plain hard work on the part of everyone in the command, we have been able to maintain, and in some cases even improve, some aspects of our capability. While it is no secret that both our ICBM and strategic bomber forces are aging, we are confident that recent initiatives to upgrade our forces will do much to improve SAC's ability to continue to deter any potential enemy.

Generally speaking, vital new programs such as the PEACEKEEPER missile, B-1B, KC-10, TR-1 and KC-135 reengining are receiving needed congressional support. In the 1984 budget, Congress authorized the procurement of 21 PEACEKEEPER missiles, multi-year procurement for 100 B-1Bs, and 24 CFM-56 KC-135 engine kits. Additionally, authorized procurement of 60 new KC-10 tankers will help alleviate the acknowledged shortfall of tankers while enhancing our capability to provide mobility support. While we have not, in some cases, received the level of support we had hoped for, such as our conventional weapons program, the results of the congres-

uture of SAC

sional authorization cycle are encouraging. However, realistically, we can anticipate continuing opposition to certain systems, such as PEACEKEEPER, to continue during the fall session.

In the area of readiness and sustainability — those things that allow us to do our job now — the picture has recently improved, but much remains to be done. Maintaining adequate peacetime spares and wartime reserves becomes more difficult as weapon systems grow older. Many components are difficult to repair and virtually impossible to replace, and while modifications of existing systems with state-of-the-art technology can increase reliability and supportability, the leadtime to procure new parts may be as much as three years. We need to continue to advocate increased procurement of adequate spares and upgrade of our industrial depot repair capability. Proposals to improve our capabilities in these areas have met with mixed success, but I am optimistic that funding levels will improve.

Nevertheless, the future of SAC, and our real ability to deter Soviet aggression, does not rest solely on the procurement of new weapon systems and spare parts. As always, it depends ultimately on each one of **you,** just as the success of all military forces throughout history has depended on the quality, training and commitment of their people. New weapon systems are useless without trained, dedicated crews, maintenance and support personnel. Despite the concerns I have discussed, our units consistently demonstrate their readiness, and prove that we have the finest people in any military organization in the world.

Lt General George D. Miller
Vice Commander in Chief, SAC

SAC is dedicated to providing you with the weapons systems, the materiel support and the quality of life that will allow you to accomplish your jobs even more effectively in the future. What the command and the nation ask of you is to continue the standards of professionalism that you and your predecessors have established. This is no easy task — it never has been — but it is without doubt the most crucial task faced by any military organization in history. The prevention of war, especially nuclear war, demands nothing less than capable equipment, the most effective training, and the best performance each of us can produce.

It is an added pleasure to formally recognize some of those "best performers" among you. Each participant in the annual SAC Combat Weapons Loading Competition is one of these best performers. Each competitor was selected and formally recognized as the best in their respective unit. They represent those high standards we have come to expect, but can never take for granted. Congratulations to each of you and I wish you all the best of luck as you compete for recognition as the "**best of the best.**"

★ ★ ★

1983 SAC COMBAT WEAPONS LOADING COMPETITION

Will September ever arrive? This is the thought running through the minds of the anxious competitors who will participate in the 1983 SAC Combat Weapons Loading Competition. Teams from 18 SAC Bomb Wings will take part in the competition to be hosted by Ellsworth AFB, South Dakota, 20 - 27 September.

The competition provides an outstanding opportunity for SAC's munitions loading, security and aircraft crew chief personnel to demonstrate those combat skills which are so essential to our strategic deterrent capability. Participants also benefit by observing their fellow competitors and discussing new and better ideas for doing their jobs.

Each competition team is comprised of a bomber aircraft crew chief, a five-person B-52 or four person FB-111 munitions load crew, a six-person security police element and a team OIC and NCOIC. Load crews will be evaluated on their loading equipment, a written test, and two weapons loadings. Security police elements will be evaluated on confidence course performance, weapons firing and practical offensive and defensive exercises. The aircraft crew chief will be evaluated on a written test, preload and postload exercises.

The major differences between past competitions and this year's are the deletion of conventional loading and security police written testing and the introduction of the security police confidence course.

The top awards for this year will be Best Wing Competition Team, awarded to the home town Ellsworth team last year; Best Munitions Load Crew, awarded to K I Sawyer last year; Best Security Police Unit, awarded to Ellsworth last year; and Best Bomber Crew Chief, also awarded to Ellsworth last year.

The excitement and hard work of competition preparation is already well under way at all participating wings. Every team is out to "top" Ellsworth's 1982 performance and claim the honored Barrentine Memorial Trophy for its own. Who will be the winners this year? Every competitor given the opportunity to participate is certainly a winner in his or her own right, but the competition at Ellsworth will once again determine the best of the best.

Good luck to you all.

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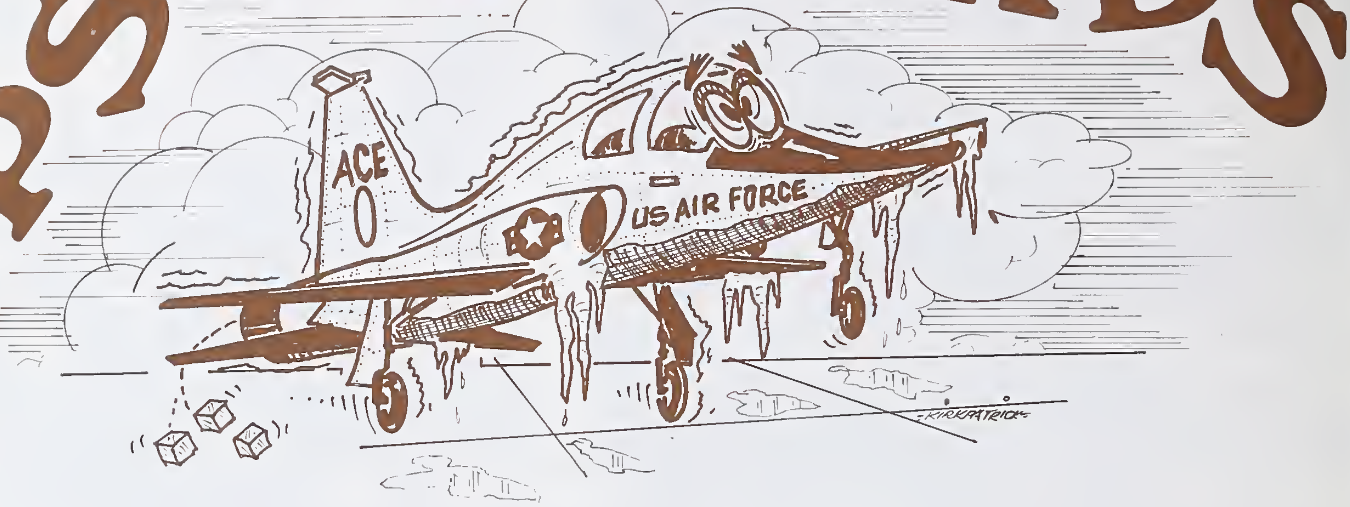
SAFETY

OPS HAZARDS



ACE 38 VS Induction Icing: ACE — 0; Icing — 1

The ACE T-38 mission was a cross country flight and weather was not a problem. Icing was forecast north of their route of flight with scattered clouds at 11,000 feet. During their enroute descent, the pilots turned on the anti-ice and pitot heat — just in case they entered icing conditions. While descending through 11,000 feet, approach control vectored them east of field, slowed them to 250 and held them for sequencing. They were in and out of the cloud tops, but at no time did they have visual indications of icing. The ACE landed uneventfully and thought they were home free. While trying to depart the next day, both engines' compressors stalled at 92% during the pre-takeoff runup check. The throttles were pulled to idle, then readvanced with the same results. The crew taxied in and shut down. Investigation showed damage to both engines' compressor section and turbine blade damage consistent with ice injection. Induction icing can occur when temperatures are above freezing and visible moisture is not present. Check your T.O. for this phenomenon of nature and make sure this doesn't happen to you.

FALCON 124 - FIRM LANDING

The T-38 sortie was a one hour instrument trainer for the back seat pilot. Flight planning briefing and take off were uneventful. The pilot in the rear seat flew a TACAN approach to the VDP and transferred control to the front seat pilot. The landing was planned to be a touch and go and then back to the radar pattern. The pilot advanced both engines to full afterburner and initiated a go-around because of a high sink rate. The aircraft touched down, remained on the runway for 350 feet and then became airborne. Tower informed the T-38 that it appeared they lost something during the touch and go; and the pilot left the gear down and locked. Another T-38 joined on the mishap aircraft and confirmed that they were indeed missing something. The left landing gear was sheared off above the wheel attachment point and the right strut appeared to bend away from centerline. The crew decided to burn down fuel and to raise the gear and make an emergency gear up landing with speed brakes extended and flaps 60°. With 700 pounds of fuel remaining, the pilot started his approach, but took it around on one mile final because of numerous transmissions on tower frequency. The second approach was a straight in, using a shallower than normal glide path. Touchdown was smooth with the aft section of the aircraft touching first and then settling onto the flaps and speed brakes. After sliding 750 feet, the speed brakes collapsed because the runway surface ground them off up to actuator attachment point. The nose dropped to the runway and the aircraft slid to a safe stop. The pilot had shut the engines down after initial contact and both crew members safely exited the aircraft when it stopped. Don't get complacent. Flying airplanes is dangerous. This highly skilled pilot had a momentary lapse in concentration which almost destroyed a T-38. He used all his years of experience to keep the aircraft flying and then to safely bring it to a full stop. You know what happens to a thousand "attaboys."

WARNING! Flight Safety says, "Checklist omissions are hazardous to your health."

A KC-135 was number two in a night MITO and cell air refueling. All was going well until the aircraft climbed through 10,000 MSL. The copilot noted the cabin altitude at 7000 feet (cabin pressure controller set at 5000 feet) but did not recognize this as an abnormal condition. To compound the problem, the tanker entered the weather and the crew's attention centered on maintaining position on lead. The cabin altitude continued to climb and somewhere between FL250 - FL280, the aircraft entered a right descending turn. The navigator noticed lead moving to the left and called for a left turn to stay in position. The pilot did not respond until the nav yelled at him across the cockpit. Pilot acknowledged but took no action. The nav told the pilots that the VVI was showing a descent and they were 84° off heading. The copilot now stated that the aircraft was not pressurizing and the pilot told the crew to go on 100% oxygen.

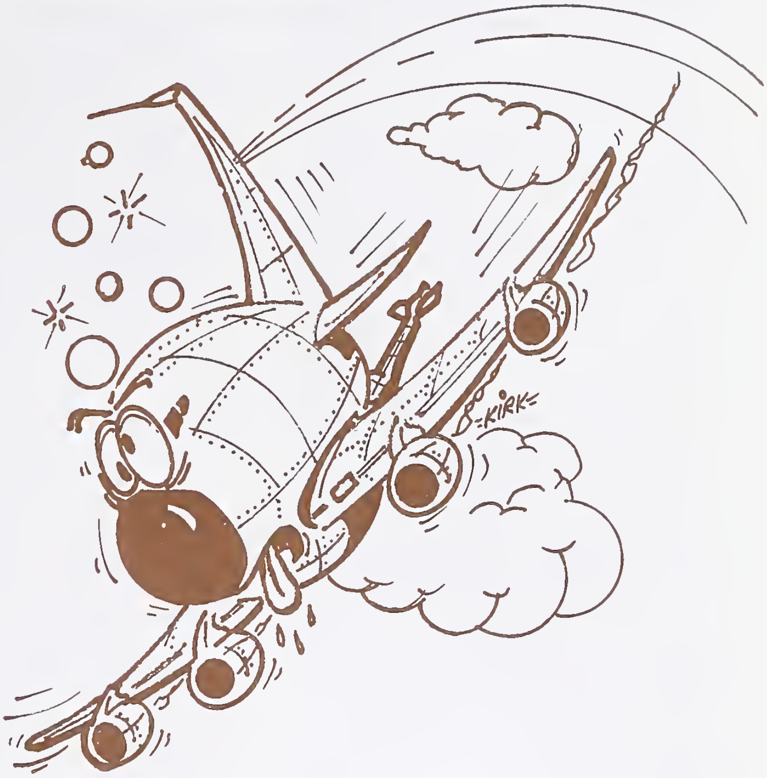
To make a long story short, the hypoxia symptoms went away after breathing oxygen, the aircraft returned to controlled, level flight and the copilot pressurized the aircraft using the alternate pressurization system. Good crew coordination made up for a missed checklist item and saved the crew and aircraft. The culprit that started the sequence of events was the air conditioner water separator which was iced over with 80 pounds of ice.

THOROUGH PREFLIGHT — NOT QUITE!

A B-52 crew chief failed to pull the copilot's seat pin during preflight. However, he did pull the streamer and stow it. The copilot failed to notice that the pin was still in the actuator during his preflight and flew the entire sortie with a "de-armed" seat. The pin was discovered during a thorough flight inspection. The first problem was a wrong sized pin was ordered from the shop. The pin that was installed was .02 inches larger in diameter than the correct pin. The only difference in the stock numbers is an "M" prefix for the correct pin but since this is a new part, it was not yet listed in the master cross reference list. The second problem was the copilot missed it on his preflight. I wonder how many times the copilot got out of his seat during the flight?

RAFTS AWAY

A B-52 was experiencing light turbulence (G forces .75 to 1.25) during low level. The crew heard a "muffled pop" in the upper crew compartment and thought that an air conditioner duct had separated because there was no air flow at the EW or gunner's station. The remainder of the mission was uneventful. Postflight did indeed reveal an air conditioning problem but the "pop" was caused when the life raft storage door separated from the aircraft. The door struck the left horizontal stabilizer and damage spoilers on both wings as it departed. Why the door departed is unknown.

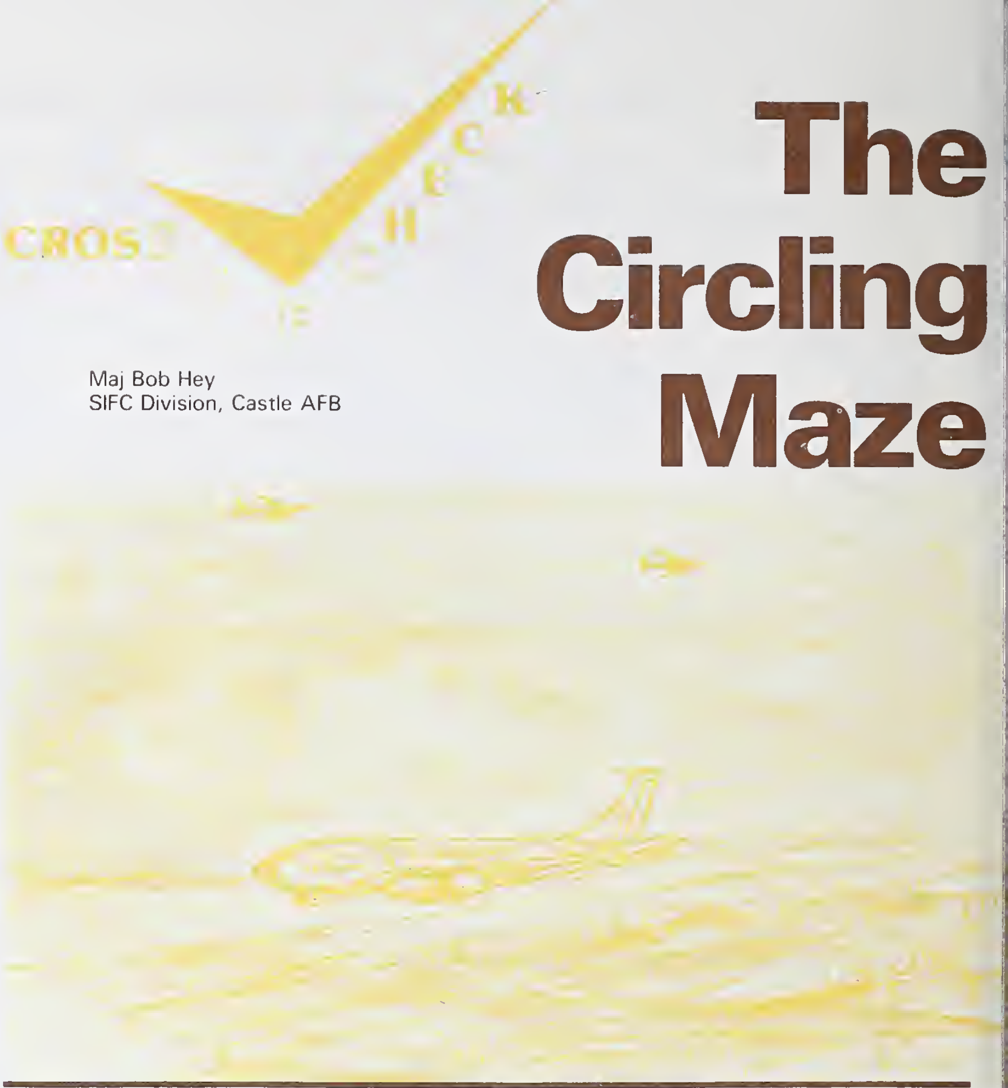


SAME GAME, SAME RULES — IT HELPS

The sortie was a night air refueling to qualify the student boom on night fighters. Lead's refueling was uneventful and he was cleared to the right wing. Number two was cleared to precontact and the instructor boom notified the receiver that his slipway door lights were inoperative but the refueling would continue. The receiver maintained a steady rate of closure to the contact position and his system advanced to "contact." The tanker's system did not advance and this momentarily distracted the student boom. The receiver continued to close and the instructor intervened with a "back four" call followed immediately by "breakaway". The receiver inspected the boom for damage but didn't see any. Postflight inspection revealed a crushed ice shield and a dented right ruddervator. What happened? It seems that both receiver pilots were waiting for the boom's call of "stabilize" prior to contact. They were keying on this radio call rather than the PDI lights to arrive at the contact position. This radio call had been removed from the tanker's air refueling manual over a year ago. Most boom operators still use the "stabilize" call out of habit or at the receiver's request, but it is no longer a mandatory call. To play the game everybody must use the same rules — especially during air refueling.

The Circling Maze

Maj Bob Hey
SIFC Division, Castle AFB



Most old heads realize that circling is an inherently dangerous maneuver not to be flown unless the weather is VFR. Quite possibly that's how they got to be old heads!

Let's imagine for a moment that you are flying down at "crop duster" altitudes after breaking off the procedure on a dark stormy night to circle to the opposite runway. The weather is 600 and 2 in moderate rain and fog. As you maneuver onto downwind, this thought suddenly strikes you: "What am I doing flying a visual maneuver at 550 ft HAA in IFR weather conditions at night?" This fleeting thought passes as the airport environment slowly fades behind your left wing tip. You become preoccupied with maintaining precise altitude control so that you don't inadvertently climb into that cloud deck barely above your altitude. To retain sight of the airport, you look back over your shoulder unaware that you have started a shallow bank toward the runway. Not feeling at all comfortable in this predicament, you decide it's time to turn base and put your machine on the ground. Halfway through the final turn, you see that a gross overshoot is imminent. Realizing that you failed to establish proper offset and that a landing would be impossible, you execute an unplanned IFR missed approach hoping for better luck next time.

The scenario we described has occurred more often than we care to admit. Unfortunately, such an error has resulted in aircraft colliding with the ground. Numerous accidents have occurred from overbanking and stalling while circling to land. The overwhelming "probable cause," according to National Transportation Safety Board records, was pilot error. These errors happened because of insufficient lateral displacement from the runway.

Do you understand why there is a tendency to fly too close to the runway while at circling MDA? Your normal perspective of the runway is seen from 1000 ft AGL or more while on downwind; not at 550 ft AGL, which is a typical HAA on a circling approach. Improper lateral displacement occurs because the pilot, in order to make the picture look the same, flies closer to the runway.

If weather permits, the best method for solving this problem is to fly the entire circling maneuver at normal traffic pattern altitude. This would give you the same visual cues that you're used to seeing and allow you

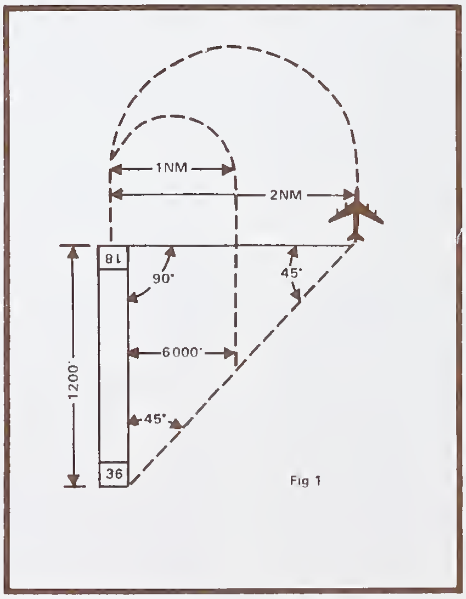


Fig 1

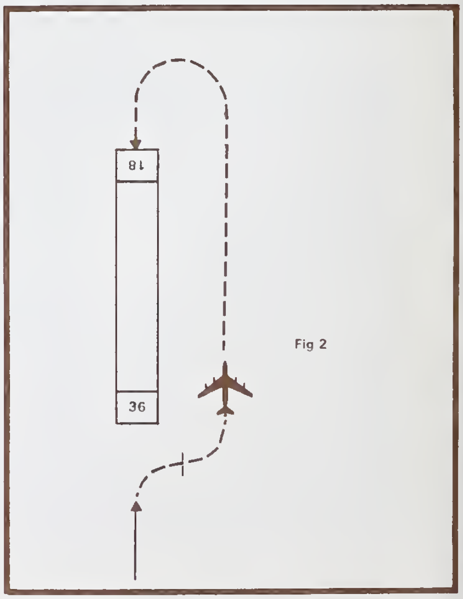


Fig 2

to "normalize" the approach.

If circumstances do not permit maneuvering at traffic pattern altitude, then it's critical that you use a technique for displacing the aircraft to a position that equates to one turn diameter. This distance from the landing runway may be obtained from a known ground reference, timing or if available, DME. Let's look at four different aircraft positioning techniques. Each technique uses a bank of 30 degrees to allow a 30 degree bank turn during the final turn (no wind). The first three techniques are useful when circling to the opposite runway. For our examples, we'll assume 180 KTAS which results in a turn radius of about one mile (Turn radius = NM/MIN - 2; i.e., TR = 3 NM/MIN - 2 = 1 NM). With a turn radius of 1 NM, we simply double this figure to obtain our turn diameter of 2 NM

(1) 45 Degree Method (Fig 1): When reaching the approach end of RWY 36, turn 45 degrees off runway heading. Hold the heading until abeam the threshold of RWY 18, then turn parallel to the runway. This gives an offset equal to the length of the runway. Since most SAC runways are approximately two miles long, this technique would provide a two mile offset. If you need less of an offset, then turn to parallel the runway abeam the proper offset point.

(2) Two 90 Degree Turn Method (Fig 2): Turn 90 degrees to the right followed by 90 degrees to the left. This technique is excellent for displacement since each turn displaces the aircraft one turn radius and two turns results in a displacement of one turn diameter. The first turn can be made when the runway is sighted or when over the threshold. A possible problem with this technique is that you may have trouble keeping the runway in sight when you are 90 degrees from runway heading, so we recommend using this technique only in good prevailing weather conditions.

(3) 30 Degree Timing Method (Fig 3): Turn 30 degrees off runway heading, time for four times the aircraft's turn radius in seconds, and then turn to parallel. This technique involves some basic geometry. For any 30-60-90 triangle, the hypotenuse (2r) is twice the length of the length of the short leg (r). If we let the distance of the short leg represent one turn radius, then the hypotenuse is twice that distance. By expanding the triangle to twice the size, the short leg becomes 2r or one turn diameter, and the hypotenuse becomes 4r. Since 10 per cent of the TAS equals the turn radius in seconds, time the distance which will displace your aircraft one turn diameter. Rather than bog you down in any more higher mathematics, let's look at an example of what we mean. At 180 KTAS, 10 percent of TAS = 18 sec; then 4 x 18 sec = 72 sec for required offset. Don't start timing until you are aligned with the runway centerline if your approach brings you in at an angle. Remember to apply drift corrections to the 30 degree leg and downwind.

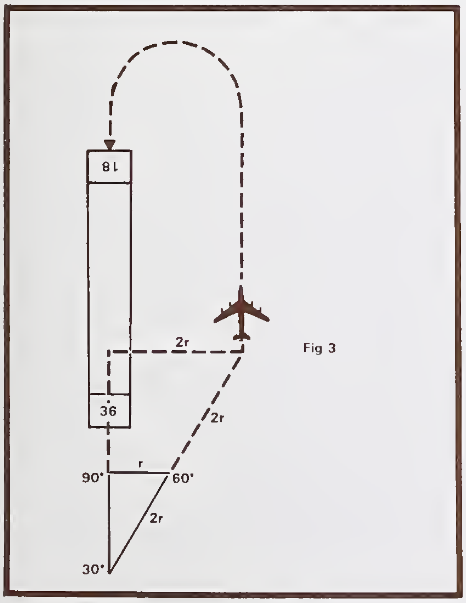
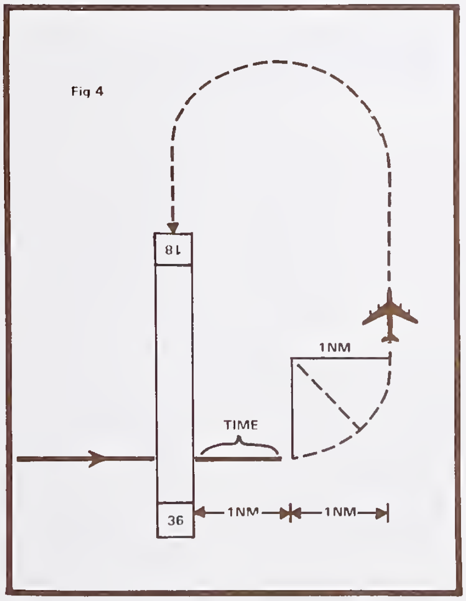


Fig 3

Fig 4


(4) One 90 Degree Turn to Downwind Method (Fig 4): Some circling approaches bring you in perpendicular to the runway. After crossing the runway, fly outbound a distance equal to your aircraft's turn radius. For example, at 180 KTAS time for 18 sec (10% of TAS), then start the turn to downwind. The timing will give you one turn radius and the 90 degree turn will provide the other.

These techniques are good for lateral displacement, but you may end up close to the visibility limit for your category. For example, a category E aircraft offset 2 NM from the runway would actually exceed its visibility limit of 2 SM (1.7 NM). Also, remember that if the prevailing visibility is 2 SM, it may not exist in the quadrant you happen to be flying through.

There is another potential problem to watch out for in applying these techniques. For a category D aircraft, you may get close to the periphery of your obstruction clearance area (2.3 NM). If it becomes necessary to maneuver at speeds in excess of the upper limit of the speed range for your aircraft's category, you should use the minima for the nest higher approach category.

A circling maneuver needn't be as deadly to pilots as it seems to be. Comprehensive preflight planning should involve an analysis of where you will be and how you intend to accomplish the circling maneuver. When arriving at your destination, pilot/controller coordination can eliminate many potential problems. While flying the circling maneuver, ensure that you are familiar with the airport layout and observe all restrictions on the approach chart. As a final note, all of these offset techniques will work in any aircraft. Once you figure out the turning radius and any timing requirements for your aircraft, you're all set to fly a safe and precise circling maneuver. Practice these techniques in good weather so you can use them confidently when the pressure's on.

Ejection —

A Crew Coordination Exercise?

Capt Ed Dixon
337 BMS, Dyess AFB

After reading an accident report have you ever wondered "Why didn't the crew eject!" Sometimes it is obvious that the aircraft was no longer flyable and the only choice the crew had was to eject. Yet they either do not attempt to eject or delay the decision until it is too late. Why? Why does a highly trained professional crew needlessly crash with their aircraft?

Part of the answer may be that the crew was not prepared for this difficult, yet crucial, decision. Ejection, like many other aspects of a multiplaced aircraft, requires a high degree of crew coordination if it is to be successful. However unlike bombing procedures, low level navigation or transition, very few crews practice or even discuss how they will handle an ejection/emergency egress situation. Each crewmember may know

his/her equipment and procedures very well but the crew as a unit is not completely ready to handle an egress situation. By devoting just a little extra time while mission planning or on alert to talking about and table flying situations which could result in an ejection can increase significantly a crew's chances to survive. Let me give a few ideas which can be used to initiate these discussions.

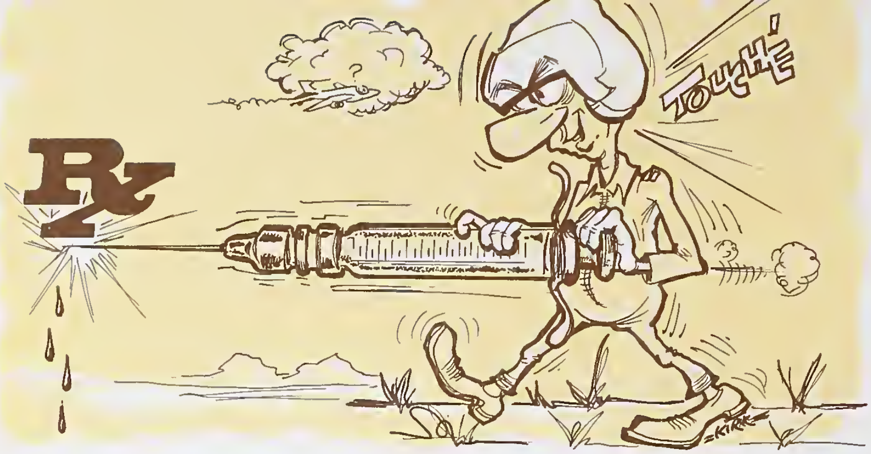
First, define these situations which would most likely result in the crew ejecting. If you don't think this is a significant point, when was the last time you asked your pilot to explain his ejection parameters?

This gets the entire crew involved in analyzing aircraft or system malfunctions. If the gunner, nav, EW and radar are at least familiar with the problems associated with landing with a main landing gear retracted as compared to a go-around with two engines inoperative they will know which situation would most likely deteriorate to the point where the pilot will have to give the "Bailout" command. They will also be able to monitor the aircraft and provide valuable information if and when it is needed.

Also if an AC conducts these discussions properly he will be preparing the copilot for a very essential role which could save the entire crew. If in a critical phase of flight the copilot is waiting for the pilot to calmly give the order to bail out after turning on the abandon light, the crew may not ever get the word. Why? The aircraft commander is going to be busy trying to maintain or regain aircraft control. He may have full rudder combined with full spoiler deflection and will not be able to get to the interphone switch. Furthermore, studies conducted by the Air Force have determined that letting go of the yoke in a critical situation is an alien reaction to a pilot. He is going to keep trying to fly the airplane even if it is not flyable. The adrenalin is going to be pumping to help him deal with stress. He is going to be depending on the copilot to help him get the crew out if he loses control.

Very close coordination must exist, therefore, between the pilot and copilot. Precise procedures must be established so that when the copilot witnesses a potential bailout situation he knows exactly what the pilot wants him to do. The copilot can monitor the power, altimeter, roll rates, etc. and can let the pilot know when things are deteriorating. Then he will be ready to relay the pilot's command to the crew.

When the time for ejection comes, DO IT. Do it as a crew. Put your knowledge, skill and judgment to work as a unit. This can only be done if you are prepared for the worst. If you wait until the airplane decides to stop flying on short final it is too late. Remember, you fly and fight as a crew, this includes "**BAILOUT!**"



℞ For Dwindling Fuel

Capt Joseph K. Costello III
407 AREFS, Loring AFB

Maj Roger D. Hartman
4 ACCS, Ellsworth AFB

Endurance.

The word conjures up varied meanings for different people. The meaning I would like to cover is how to remain airborne on the least amount of fuel. Specifically, how can you stay airborne for the longest period of time on a given quantity of JP-4? When maximum time is your objective, you can stay airborne longest by using maximum endurance procedures. As a result, you'll use minimum resources to accomplish your mission. I could cite the performance manual (pg 1A 6-5 for tanker types) and just call it quits. Instead I'd like to examine the aerodynamic why and wherefore of endurance performance.

Maximum endurance happens when total fuel flow is minimized. Total fuel flow is minimized when total drag is minimized. Total drag is composed of induced drag and parasite drag. Induced drag, caused by lift, decreases as speed increases. Parasite drag, caused by viscous shear stress (resistance to movement through air), increases as airspeed increases. Plotting the two and their total, we find a graph, illustrated in figure 1. At the lowest point of the total drag curve, there is minimum fuel flow, hence maximum endurance. This lowest point coincides with a certain equivalent airspeed for any particular weight.

Fig 1

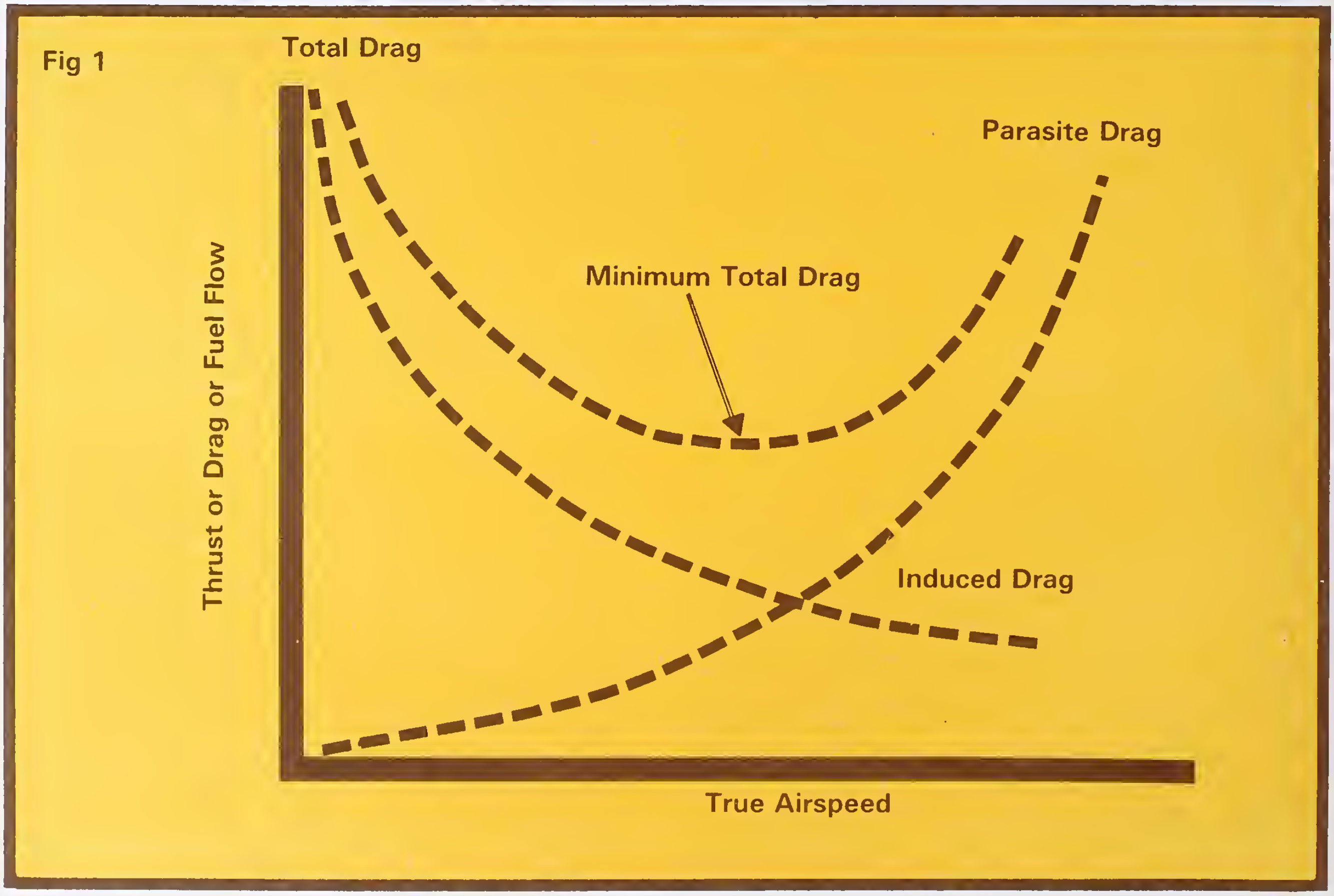
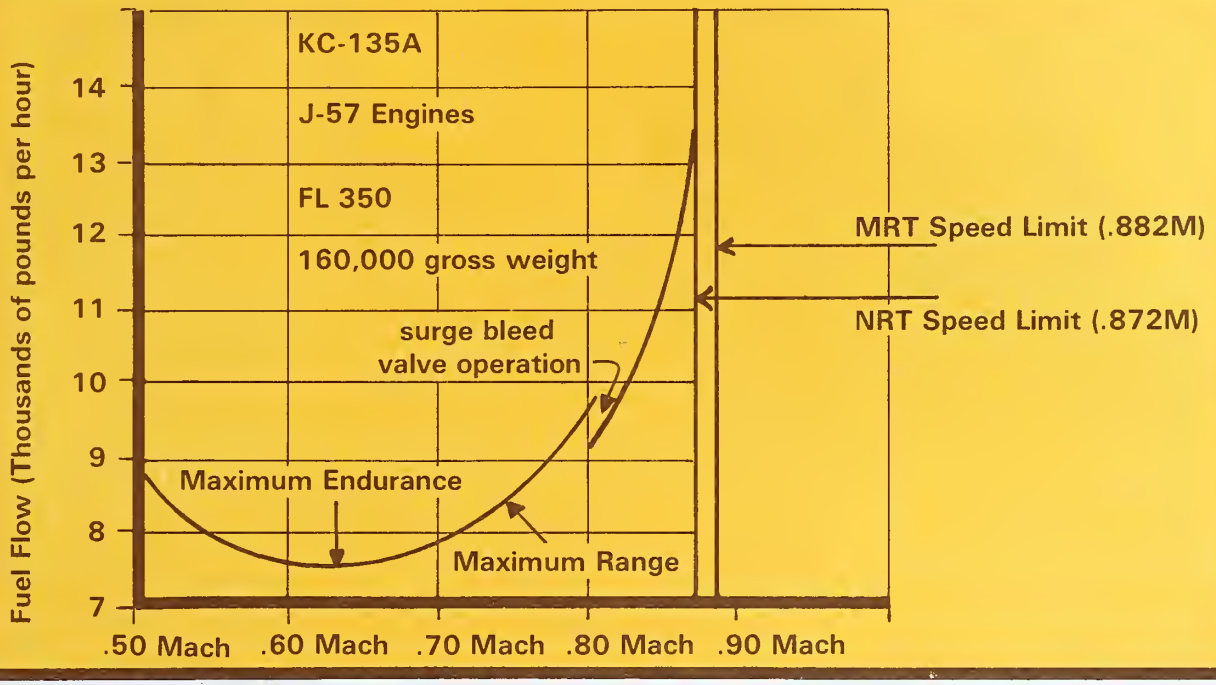


Fig 2



Minimum drag occurs at a given equivalent airspeed (K-EAS) for each weight and for each altitude. The problem is how can you, in the cockpit, tell if you're at maximum endurance equivalent airspeed? Fortunately, those of us driving AOA equipped airplanes need look no further.

In level flight, Lift = Weight. $\frac{\text{Lift } L}{\text{Drag } D}$ therefore equals $\frac{\text{Weight}}{\text{Drag}}$, and the fraction $\frac{\text{Weight}}{\text{Drag}}$ will be maximized.

Stated another way, minimum drag means (L/D) max.

This always occurs at a single fixed AOA. Let me restate that. In level flight, maximum endurance occurs at a single, fixed value of AOA, regardless of gross weight or altitude. If you fly an airplane which has no AOA indicator, or would like to check the AOA indicator, there is another way to derive the best endurance. For each weight, the max endurance AOA occurs at a single value of KEAS. KEAS is related to knots calibrated airspeed (KCAS) by the F factor. For cargo haulers, F varies between 1.0 to 0.96 in the flight envelope. In other words, KEAS is at least 96% of KCAS. Each flight manual gives the correction between KCAS and knots indicated airspeed (KIAS). The correction is small for cargo haulers. So as a practical matter, heavy aircraft can consider KEAS the same as KIAS and use a single value of KIAS for best endurance at any particular weight. The required airspeed for max endurance at each weight is in the flight manual.

"So what does this mean to me, the crewmember in the cockpit?" you ask. Let's look at an example of a specific total drag curve, figure 2. This example is for a KC-135, but any subsonic turbojet airplane has the same shape curve. Minimum fuel flow (7683 pph) occurs at a point coincident with minimum drag (maximum endurance speed). Of course, this curve is only for a single weight and altitude. With a lower speed, you are operating in the infamous "region of reverse command." At a particular weight and altitude, if you go slower or faster, you will use more fuel per hour.

Many aerodynamic conditions occur at (L/D) max, which is best endurance airspeed. Because it is at the point of minimum drag, best endurance offers maximum excess thrust. (Thrust available is fixed). Consequently, max angle of climb speed, best glide speed and max rate of acceleration all occur at best endurance airspeed. The latter condition results in the air refueling manual caution stating "If . . . charted air refueling speed will be used as air refueling speed with B-52 receivers to provide better acceleration capability." Max endurance speed is very important to pilots.

There are some things max endurance airspeed is not. It is not max range! Max range is always faster than max endurance. Max endurance is also not near the stall or initial buffet. For a 160,000 pound KC-135 at FL 350, max endurance is 209 KIAS and initial buffet 149 KIAS, a 60 knot difference. Not even in the same neighborhood!

Know what maximum endurance speed is and use it to conserve JP-4. The next time you have to delay for any reason, try different speeds and see if max endurance speed isn't the speed to fly for minimum fuel consumption. Remember, there is nothing more useless than the altitude above you, the runway behind you or the fuel you've already burned!

RED FLAG

Prep for the FB-111

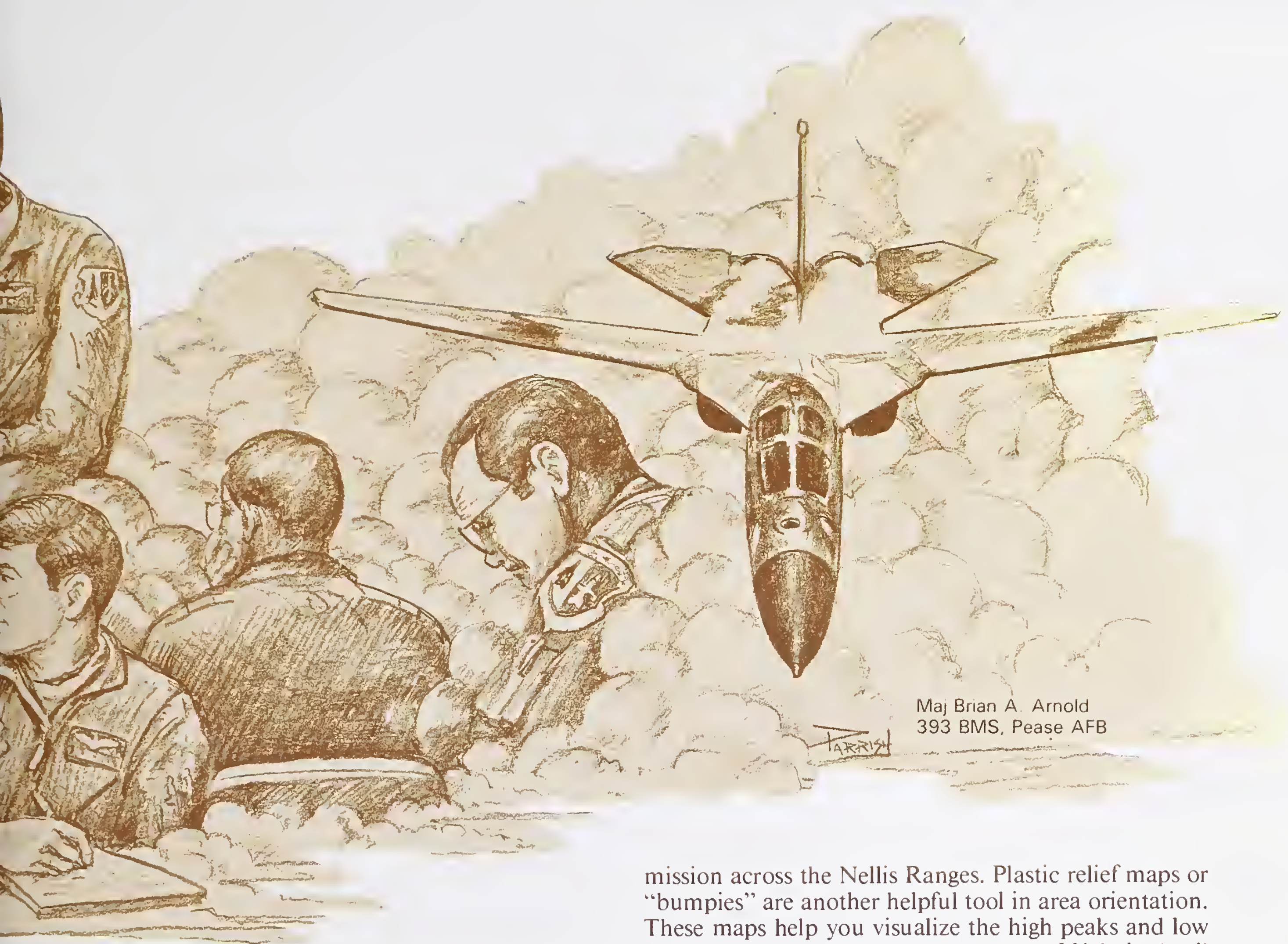
So it's your turn to go to RED FLAG again, or perhaps it's the very first time. In either case, you should be fully prepared to "hit the ground running" when you arrive at Nellis AFB. Trying to catch up on range procedures at the last minute in your hotel room isn't exactly my idea of a good time. In all seriousness, I have a few tips to offer in preparation for your next visit to RED FLAG. Specifically, I'd like to go over how we, the 393 Bomb Squadron Tigers, prepare for RED FLAG in terms of safety, operating procedures and area orientation.

From the very start you need to understand that flying in the RED FLAG arena is a demanding flying environment. It is the most dangerous environment short of actual combat and therefore, safety is paramount. Flying at 1.3 Mach at 200 feet above the ground doesn't give you much of a margin for error — and remember the ground has a PK of one. So again, the most important item to emphasize is safety.

Have your operating procedures down cold. As soon as you receive the Special Instructions (SPINS), spend time going over the package. Talk to others who have been there if you don't understand a procedure. Our squadron spends time during each hanger flying meeting discussing these operating procedures in depth. The better you know the procedures, the easier it will be for you to concentrate on other areas.

Another area to discuss is ego control. It's very easy to get caught up in the excitement of RED FLAG and let your ego get in the way of common sense. We're at RED FLAG to learn and practice new techniques; if in that process we are "shot down" by an aggressor we have learned something. So know your own limitations and don't let all that talk at the bar influence your common sense. Situational awareness is a key factor that deserves attention. You will be faced with some of the most intense situations you have ever encountered. Between keeping an eye out for other aircraft (Nellis Control averages more than 400 sorties daily), evading the aggressors, jinking around the threats, and attacking the target, you must be constantly aware of your environment. This situational awareness involves knowing where you are, what comes next and constantly being in control of your aircraft. For the pilot this means keeping your eyes outside the cockpit.

The problem of optical illusion is a constant factor during RED FLAG missions. For most of us the featureless desert gives a false sense of altitude. The flat terrain lacks definition and thus causes a depth perception problem. Such terrain features as sage brush versus trees may cause you to reduce altitude to make the sage brush look like the trees that we are all used to flying over. In the steep mountainous areas, a false horizon in rising terrain can cause an insidious illusion



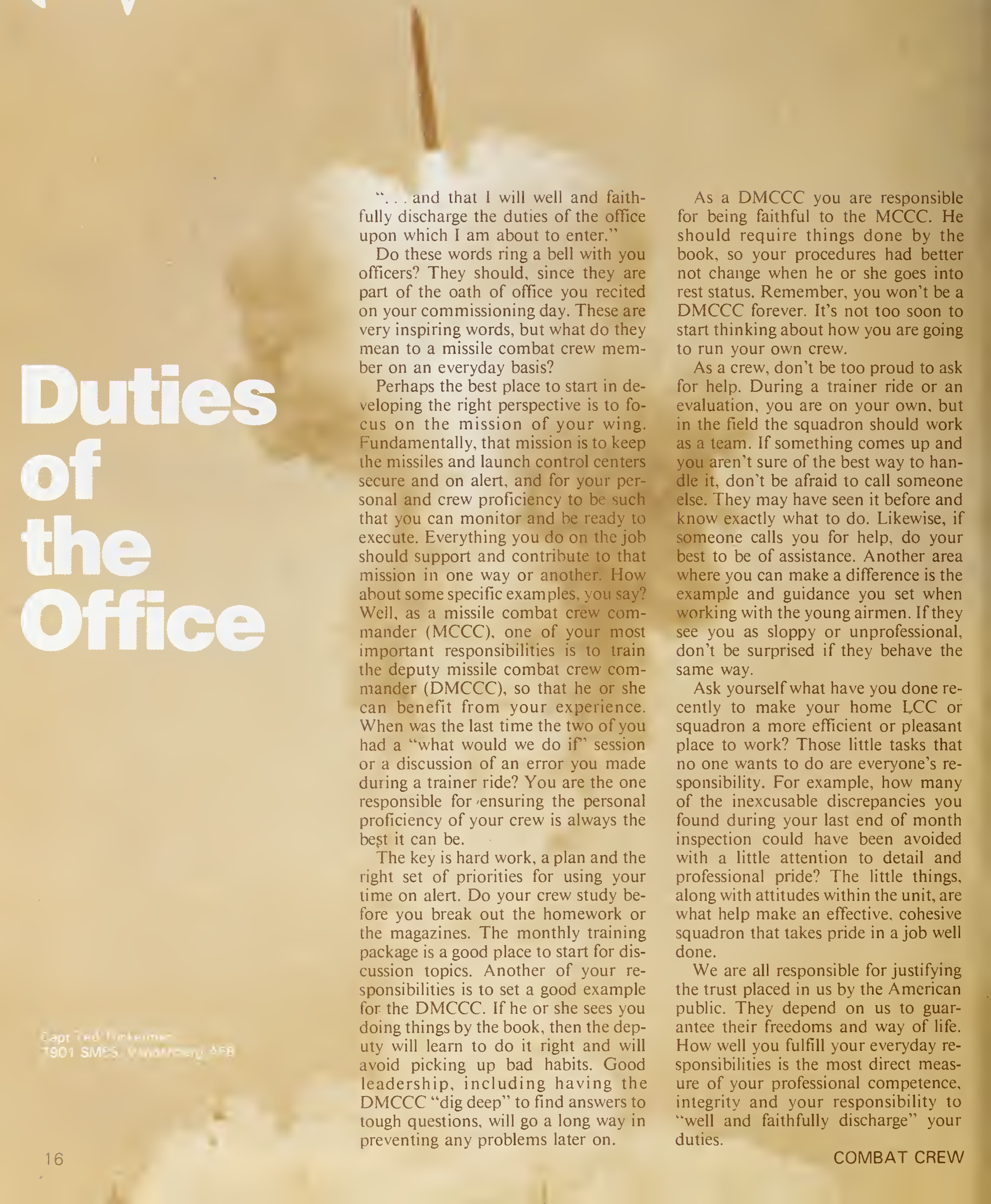
Maj Brian A. Arnold
393 BMS, Pease AFB

of a ridge line being lower than it actually is and thus not allow sufficient time to clear the top. An additional problem is presented by the time of day and the relationship of the sun. Certain positions of the sun cause mountains to blend into shadows and hide the terrain. Late in the afternoon the sun may be directly in your eyes. These factors make it even more important to rely on our terrain-following radar capability.

Another area of particular interest is reviewing the lessons learned by crews who have been there before. Cross-talk of mistakes previously made might save you a little embarrassment, teach you better techniques or more importantly save your life. The "old heads" in our squadron have put together a slide show of a typical RED FLAG deployment which is most beneficial to first time crews. After viewing the slide presentations you can also begin to develop a feel for what to expect in terms of terrain features. In addition to viewing these slide shows, each crewmember plots his own map of the Nellis ranges. Of particular interest is the correct plotting of area boundaries and restricted areas. Since most of your flying will be "heads out of the cockpit," study the maps for prominent landmarks such as Coyote Peak, Student Gap, Mt Irish, Belted Peak, Cedar Peak and Mt. Worthington. These important landmarks will be a definite aid for orientation on your first mission across the Nellis Ranges. Plastic relief maps or "bumpies" are another helpful tool in area orientation. These maps help you visualize the high peaks and low flats, and allow you to select your route of flight in detail using terrain masking to your advantage.

Once you have studied the range maps you should next become intimately familiar with the detailed departures and arrivals of Nellis AFB. These procedures were designed to allow the maximum flow of traffic into and out of Nellis AFB in minimum time. So both crewmembers need to take the time and discuss these procedures. A very helpful technique is for the radar navigator to assist the pilot in calling out required altitudes and headings during departures and arrivals, especially in three ship formation. After indepth study of these departures and arrivals, we schedule each crew for a one and one-half hour simulator to practice these procedures.

Hopefully these ideas will help your unit safely prepare for its next RED FLAG deployment. Remember all the time you spend preparing at home will make your operation run that much smoother and safer. Be sure to keep a log of lessons learned to share with the new people in your unit. These tips apply to all units participating in RED FLAG. I certainly haven't covered everything that you need to prepare for and I know you will have some things to add to my list. The flying at RED FLAG is totally unique and very demanding, and I'm sure you'll feel challenged by the variety of the mission and the realistic training. Enjoy your next trip to RED FLAG and remember above all else, **fly safe!**



Duties of the Office

Capt Ted Finkelmer
3901 SMES, Vandenberg AFB

". . . and that I will well and faithfully discharge the duties of the office upon which I am about to enter."

Do these words ring a bell with you officers? They should, since they are part of the oath of office you recited on your commissioning day. These are very inspiring words, but what do they mean to a missile combat crew member on an everyday basis?

Perhaps the best place to start in developing the right perspective is to focus on the mission of your wing. Fundamentally, that mission is to keep the missiles and launch control centers secure and on alert, and for your personal and crew proficiency to be such that you can monitor and be ready to execute. Everything you do on the job should support and contribute to that mission in one way or another. How about some specific examples, you say? Well, as a missile combat crew commander (MCCC), one of your most important responsibilities is to train the deputy missile combat crew commander (DMCCC), so that he or she can benefit from your experience. When was the last time the two of you had a "what would we do if" session or a discussion of an error you made during a trainer ride? You are the one responsible for ensuring the personal proficiency of your crew is always the best it can be.

The key is hard work, a plan and the right set of priorities for using your time on alert. Do your crew study before you break out the homework or the magazines. The monthly training package is a good place to start for discussion topics. Another of your responsibilities is to set a good example for the DMCCC. If he or she sees you doing things by the book, then the deputy will learn to do it right and will avoid picking up bad habits. Good leadership, including having the DMCCC "dig deep" to find answers to tough questions, will go a long way in preventing any problems later on.

As a DMCCC you are responsible for being faithful to the MCCC. He should require things done by the book, so your procedures had better not change when he or she goes into rest status. Remember, you won't be a DMCCC forever. It's not too soon to start thinking about how you are going to run your own crew.

As a crew, don't be too proud to ask for help. During a trainer ride or an evaluation, you are on your own, but in the field the squadron should work as a team. If something comes up and you aren't sure of the best way to handle it, don't be afraid to call someone else. They may have seen it before and know exactly what to do. Likewise, if someone calls you for help, do your best to be of assistance. Another area where you can make a difference is the example and guidance you set when working with the young airmen. If they see you as sloppy or unprofessional, don't be surprised if they behave the same way.

Ask yourself what have you done recently to make your home LCC or squadron a more efficient or pleasant place to work? Those little tasks that no one wants to do are everyone's responsibility. For example, how many of the inexcusable discrepancies you found during your last end of month inspection could have been avoided with a little attention to detail and professional pride? The little things, along with attitudes within the unit, are what help make an effective, cohesive squadron that takes pride in a job well done.

We are all responsible for justifying the trust placed in us by the American public. They depend on us to guarantee their freedoms and way of life. How well you fulfill your everyday responsibilities is the most direct measure of your professional competence, integrity and your responsibility to "well and faithfully discharge" your duties.

Son, Keep 'em Flying

This letter, printed originally in February 1973, was written by an old SAC pilot to his son who had just been assigned to a SAC wing.

Dear Son,

I'm happy to hear that you have settled into your new base and seem so enthusiastic about flying one of the big birds. Graduating from pilot training today is quite an accomplishment. The T-38 certainly dwarfs the T-6 of many years ago. Although you have passed a milestone in your career, I'm sure you realize you have just scratched the surface in this flying game. At the risk of sounding stuffy, I want to try to emphasize a few lessons I've learned and give you some of my insight — for whatever it is worth — into the problems facing you as a young man in SAC.

What you must understand is that the Training Command IP is not going to be at your elbow all the time now. That's not to say that you won't have plenty of visitors riding behind you and your pilot. There will be a host of staff evaluators, stanboard evaluators and visiting firemen from HHQ going along on practically all of your missions. If you can quickly learn to ignore them, you have the battle half won. Always treat them with sincere courtesy, but never depend upon them for anything. Flying the bird is up to you and your AC.

You'll find that the experience level in terms of logged flying time is down drastically over what it was 10-12 years ago. In those days, the AC was a Major or Lt Colonel with 5-6,000 hours. B-47 ACs, for example, once had to be dual rated as a pilot and a navigator. When the B-52 and KC-135 programs began, the pilots and navs were old heads from the B-36, B-47 or KC-97 programs. They had only to master a new airplane, they knew all the routines of SAC. Today you have not only a different aircraft, but you have an entirely new lifestyle to learn. And you don't have large numbers of old heads to depend upon. Even the boomers and the gunners are young airmen and sergeants. You will be extremely lucky if you get crewed up with an older sergeant who has the knowledge and the ambition to initiate new crewmembers into the proper paths and keep them out of trouble.

What I'm saying is that you have finally found the real Air Force. You will have to be man enough to recognize that fact and start contributing right from the start. The flashy formation flying, the cool cross countries to Vegas, the uniform affectations such as turtle-necked T-shirts, turned up collars and bareheaded strolls around the line will have to go. You are no longer Steve Canyon. You may even be Mr Second Copilot. And you will pay for those happy days of pilot training with many hours of alert duty. In the process you are going to be tested as a flyer, as an officer, and as a man.

You are going to have to back up that young AC so that you and he can cope with anything. You are going to have to anticipate every kind of emergency that could possibly happen. You will have to learn quickly who is the expert in any given area, and you are going to have to ask intelligent questions and pursue your training till you are satisfied. I'll give you all the help I can because that is my obligation, not only as your father but as a more senior officer and flyer. In future letters, I'll concentrate on a single subject that may be of some interest to you. Hopefully my letters will generate your thinking and help to mature you quickly — because you will be in that left seat much sooner than you suspect.

It's getting late now and tomorrow is a big day. Drop me a line when you can and give me your frank views on what is happening to you. Don't let my serious tone throw you. I'm continually impressed with the work of our young aircrews who are doing the job well under the most demanding circumstances possible. Perhaps if we can somehow transmit the distillate of experience from our supervisors to our younger people, we can eliminate the needless accidents and incidents we still experience. Keep 'em flying!

Love, Dad

When Was the Last Time You Practiced . . .

SMSgt Elzey G. Richardson
CFIC IBO, Carswell AFB

Could you extend the landing gear quickly, correctly, and safely as a crew? As a crew, could you extend all the landing gear in two minutes? Your life may someday depend on it. Stop for a minute and ask yourself: "When did I last practice manual gear and flap lowering?" You say — "Ahh, Castle in 1980 during initial qualification training; or I guess eight months ago when it actually happened." How long did it take? Ten, fifteen, twenty minutes? Most probably you have not seriously reviewed the procedures (except for the caution and warnings) for several years.

At CFIC, we find that very few instructor candidates (navigator, boom operator or pilot) **can correctly and safely manually lower the gear in less than five minutes.** Even with detailed prebriefing, the crewmembers experience difficulty. In addition to unfamiliarity with the procedures, crew coordination often breaks down or becomes so confusing that it severely hampers completion of the task. To further compound the problem, major errors are often committed which render the gear lowering ineffective. The result is that the gear is not properly and safely extended.

Often candidates believe all they must do is follow the abbreviated checklist without reviewing the amplified portion of the tech order. This common misconception becomes painfully evident when the entire instructor candidate team humbles themselves during their first attempt at the procedure. The abbreviated portion of each specialty checklist outlines the proper sequence but each crewmember must understand the procedures and objectives and recall how his/her tasks fit into the overall procedure. Let's examine a few of the problem areas associated with manual gear lowering, whether in practice or for real.

Pilots, to provide the scenario to practice landing gear emergency operation you should depressurize the left hydraulic system, simulating its failure. Initiate the landing gear emergency extension checklist and have the copilot accomplish the pertinent cockpit items. Finally, the pilot clears the nav or boom operator to lower the gear using manual procedures.

After the pilot clears you to lower the nose gear, it's not necessary to ask the pilot for clearance to lower the main gear after reporting in on the cargo compartment interphone. Simply check in on interphone and continue the checklist. Remember the pilots will be busy flying the aircraft and reviewing landing considerations. Each time you talk on interphone, you risk interrupting radio transmissions from ARTCC or other agencies. Likewise, pilots, don't try to assist by relaying to the navigator or boom operator every indication you have in the cockpit. The gear indicators in the cockpit are electrically actuated during manual gear extension. The nav or boom must also confirm the gear locked by visually checking all the gear indicators. The "real" indicators, in this situation, are the alignment stripes that will be visually checked by the nav or boom

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The first step of the nose gear emergency extension checklist is a little confusing because the nose gear doors cannot be visually checked open. The nose gear inspection window is positioned too far aft of the nose gear doors to actually view them. The window is positioned so you can view the alignment stripes. You can be assured the nose gear doors have opened by listening for the increased noise level as the doors open into the slipstream when the nose door release handle is pulled forward.

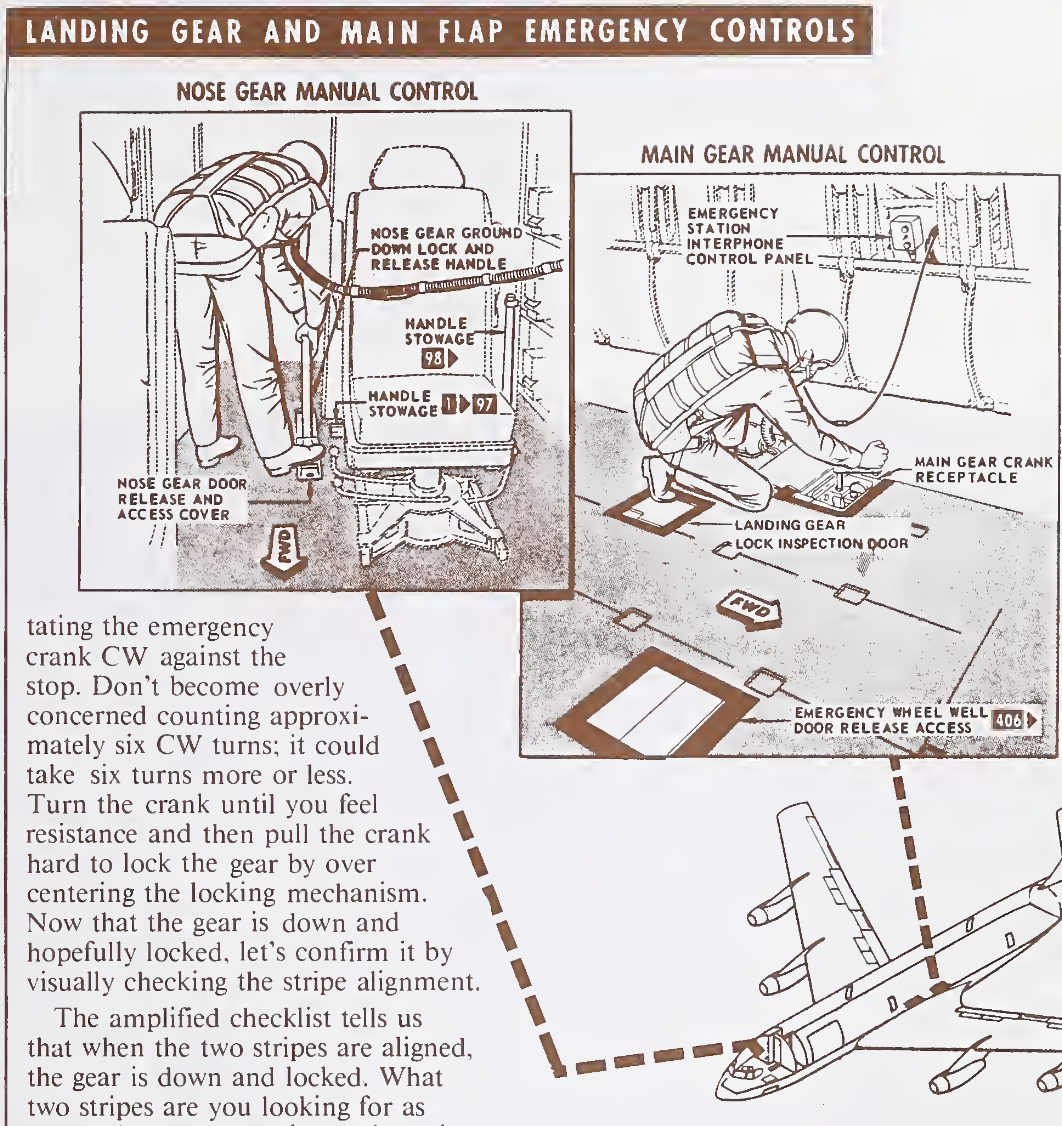
Step four of the checklist also causes confusion. Sometimes the striker on the nose gear ground down lock and release handle is not aligned with the locking hook and engagement does not occur when you attempt to lock it into position. If that occurs, simply depress the button beneath the nose gear door release and access cover. This should allow the locking hook to properly engage. Insure the striker is engaged on the locking hook. To confirm positive nose gear extension and locking visually check the stripe alignment and have the pilot or copilot confirm "locked" indications on the instrument panel. From the time you were cleared by the pilot to lower the gear until the nose gear is extended and locked should not take much longer than 15 to 20 seconds. Now you are ready to check off interphone and proceed to the cargo compartment to extend the main gear.

In order for you to lower the main gear, the troop seats must be stowed. No sweat — you stow the troop seats by pulling upward on the lower section of the troop seat leg to disengage the legs from the seat studs. Once the legs are unlocked, push the seat up and toward the fuselage. Many CFIC instructor candidates (both nav and boom) have struggled to unlock the troop seats for over a minute before asking for help. Lack of experience and proficiency cause a simple task to become an obstacle.

When you examine the gear crank receptacle, remember that the forward receptacle controls the right gear and gear door. Now that you know which receptacle will extend the desired gear and the recommended sequence of extension, you need to get down to the very basics. Look at a wristwatch with a dial face and determine which way is clockwise (CW) and counterclockwise (CCW). I realize this is absolutely silly but CFIC instructors repeatedly observe candidates attempting to lower the gear while turning the emergency crank in the WRONG DIRECTION. After a few turns, they generally realize they have made this embarrassing error.

CFIC instructors recommend lowering the right main gear first. If the left main gear is extended first you must contend with the increased noise level directly beneath the receptacle while manually lowering the gear; therefore, by lowering the right main gear first, you can turn the crank slowly (approximately one and one-half turns counter-clockwise) or until you hear the noise level increase as the gear doors open into the slipstream. Then you can visually check the doors open before continuing with the gear extension. Yes, the noise level from the right main gear is still there but remember you are directly on top of the left main gear. As you open the left gear door, you will experience an even greater noise level as it extends into the slipstream; visually confirm the door open and finish extending the gear.

Insure the emergency crank is fully seated before turning the crank CCW until the gear door opens. The amplified checklist says to turn the crank one and one-half turns CCW. Turning the crank one and one-half times CCW is okay but the overall objective is to open the gear doors and extend the landing gear. A total of approximately three CCW turns are required to accomplish the objective. It may take something more or less than the quoted number of turns to open the door and to get the gear to fall; don't get overly concerned with the "exact" number of turns. After gear extension, lock the gear by rotating the emergency crank CW against the stop. Don't become overly concerned counting approximately six CW turns; it could take six turns more or less. Turn the crank until you feel resistance and then pull the crank hard to lock the gear by over centering the locking mechanism. Now that the gear is down and hopefully locked, let's confirm it by visually checking the stripe alignment.


LANDING GEAR AND MAIN FLAP EMERGENCY CONTROLS

NOSE GEAR MANUAL CONTROL

MAIN GEAR MANUAL CONTROL

NOSE GEAR GROUND DOWN LOCK AND RELEASE HANDLE
HANDLE STOWAGE 98
HANDLE STOWAGE 1 97
NOSE GEAR DOOR RELEASE AND ACCESS COVER
FWD
EMERGENCY STATION INTERPHONE CONTROL PANEL
MAIN GEAR CRANK RECEPTACLE
LANDING GEAR LOCK INSPECTION DOOR
FWD
EMERGENCY WHEEL WELL DOOR RELEASE ACCESS 406

The amplified checklist tells us that when the two stripes are aligned, the gear is down and locked. What two stripes are you looking for as you look through the inspection windows? If you are not sure, examine figure 1-49 of T.O. 1C-135 (K)A-1. You don't want to mistake the oleo extension or truck level indicators for the main gear alignment stripes. Occasionally, Murphy's Law even becomes involved in this simple visual check primarily due to the individual's experience level. After checking the stripe alignment, Step 8 directs us to "remove the crank, clear the pilot to repressurize the hydraulic system." Allow me to quote some of the common reports candidates make at this point. "Pilot, boom (or nav) we're done in the back" or "pilot; boom (or nav) gear lock handle removed, cleared to raise the gear." You need to know that following gear extension and emergency crank removal, the pilot will pressurize the hydraulic system and that is exactly what you must tell him, "You're clear to pressurize." Once this is accomplished, the pilots need to continue their part of the checklist.

The pilot's checklist tells them 1) to repressurize the hydraulic system and 2) recheck the gear indicators. Rechecking the gear indicators involves scanning the visual gear lock indicators in the rear as well as the electrical indicators on the instrument panel. Step 9 of the nav and boom's checklist requires them to check alignment stripes following hydraulic system pressurization to insure the gear did not unlock. Don't be in too big a hurry to recheck the indicators, navs and booms. Give the pilots time to continue the checklist and wait for the call, "Gear indicators — recheck." If you are unsure or experience an excessive delay, inform the pilots again or visually check the gear/gear doors. In an ac-

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Cockpit Distraction

SrA Russ Wheale
92 BMW, Fairchild AFB

The L-1011 with 163 passengers on board was in the landing pattern at Miami International Airport when the flight crew observed that one green light (indicating the nose wheel was down and locked) had not come on. The aircraft was vectored away from the airport to the northwest at an assigned altitude of 2000', while the crew attempted to determine whether they had a wheel mechanism failure or simply a light bulb failure. The next four minutes has become a classic horror tale in aviation circles, via newspaper headlines and the art of the novelist and television dramatist. While the crew was grappling with the problem, the aircraft, after initially being placed on autopilot, somehow was deflected from its intended flight path and slid imperceptibly toward the ground. A last second effort by the captain to pull up failed and the aircraft crashed with a devastating impact into a northern corner of the Florida Everglades. Ninety-four passengers and four crewmembers died. The date was December 29, 1972; the time was 18 minutes before midnight.

The degree to which a cockpit distraction can absorb the attention of a flight crew can be seen in the fact that there were four persons in the cockpit at the time when the problem surfaced (including the captain), and yet none of these observed the loss of altitude as the airplane descended through 1750 feet. The captain's attention was said to have been divided between assisting the first officer to remove and replace the nosegear warning light and directing the two other crewmembers who were attempting to make a visual sighting of the nosegear from the foreward electronics bay.

One factor not stressed was the absence of visual reference to the ground. The hour was late — nearly midnight — and the local weather was described as clear with unrestricted visibility. It was dark and there was no moon. The terrain in the impact area was flat marshland, covered with soft mud under 6 to 12 inches of water. Elevation at the accident was approximately eight feet above sea level. There was no human habitation for miles in any direction.

In night flying there is no direct connection between the visibility range and visual reference to the ground. On moonless nights the only objects that may be seen from the cockpit are those which are illuminated sufficiently to stand out from the background. If any of the flight crew of the ill-fated L-1011 had glanced out of his windows he would have seen nothing below to warn him that the aircraft was dangerously low.

A last second effort by the captain to pull up failed and the aircraft crashed with a devastating impact.

Many pilots are unaware of how much we depend on visual reference to the ground, even in highly sophisticated aircraft. Through long ingrained habit we have learned to make instant approximate calculations of our elevation above the ground by the size of a tree, a building, a person, etc. When the terrain becomes shadowy or indistinct, visual reference is reduced to guesswork — which makes for risky navigation — or dependence upon instruments which must be monitored continuously and maintained in accurate calibration. In a very real sense, night flying is always a form of instrument flight.

Ordinarily, such factors as the amount of moonlight are not considered by pilots in flight planning. In fact some flights that culminate in a night landing so happen only because of a delay enroute. The prospect of arriving at the destination airport an hour or so after sundown may not seem to present any inherent difficulties, as long as weather and visibility remain good. But the abrupt loss of visual clues in flight can lead to disorientation and loss of control.

Human beings are not blessed with instant visual adaption to dark. Almost everyone has had the experience of walking into a darkened movie house and having difficulty identifying people in nearby seats for the first few minutes. Human eyes require at least eight to ten minutes to achieve a significant degree of dark adaption. At dusk a rapid descent from altitude where the sun is still visible down to an airport already in shadow, can reduce the light level faster than some individuals' eyes can accommodate to the change. The pilot may have difficulty in reading his panel instruments, as well as in picking out terrain features. Even when the destination airport is well lighted, the pilot who is not used to approaching it after dark may have trouble with his landing or with locating the runway. In some instances pilots have mistakenly landed in the dark at the wrong airport or on a taxiway.

Obstructions to aircraft which are no problem in daylight, when they can be readily seen, may become fatal hazards at night when they drop out of sight — and memory — if not illuminated. It comes as a surprise to many pilots to learn that FAA has no authority to require lighting or other marking of ground objects, such as towers, wires, or the like. The responsibility of knowing about possible obstructions at various altitudes and locations along his flight path rests with the pilot, who should identify them in his flight planning. Lights on remote structures occasionally burn out or are damaged inadvertently and such outages may not be immediately remedied. Any unlighted tall tower a pilot observes should be reported to the nearest FAA flight service station. Voluntary compliance with lighting and obstruction standards on the part of owners has been very good.

Drowsiness and fatigue are two threats to flight safety which lie in wait for the careless pilot at all times, but at night they are particularly dangerous. The absence of visual stimulants, the drone of the engines, the warmth of the heated cockpit and the natural tendency to seek rest at night are all highly conducive to dozing at the controls.

The loss of visual reference in the night flying environment may be compensated for in various ways, all of which contribute to better airmanship:

More extensive flight planning. Since you may have to make a decision about the terrain below you on the basis of what you know about it, rather than from what you can see, you will want to do your preflight planning conscientiously, plotting out the presence of every peak, tower, etc. that lies under your flight path. Assume a pitch dark night — even if there is a moon it could be obscured later by a cloud, or down behind the horizon when you need it. Spot all possible emergency fields in terms of distance or time from departure.

Visibility. Check out your ability to read your instrument panel before you get airborne in the dark. The cockpit light level is usually kept low, in order to facilitate looking out at night, but this makes it more difficult for the eye to focus on small objects or print. Study your charts in advance — they are hard to see at night under dim illumination.

Lights. Make certain that all internal and external lights are working properly including your landing lights.

Alertness. Get adequate crew rest. Recognize that flying can be fatiguing to the eyes, that many persons lose some visual acuity when tired or at altitude or in the presence of tobacco smoke. Take along a thermos of coffee or some chocolate bars if these help keep your energy up. Conditions of night flight are different from daytime flight. Prepare yourself to cope with the difference before setting out after dark.

Aircraft Maintenance

MSgt Harold R. Collum, 97 BMW, Blytheville AFB, has been selected as the SAC Maintenance Airman of the Month. As NCOIC of the Equipment Maintenance Branch, Sgt Collum developed and implemented one of the most comprehensive and aggressive training programs in the wing, to greatly upgrade the experience level of all branch personnel. This program, coupled with his management and inspection techniques, resulted in consistently superior performance on higher headquarters inspections. During his assignment, his branch has received four evaluations from the SAC IG. The first two were rated excellent with the two most recent being noted outstanding. Sgt Collum's branch consistently receives outstanding quality control reports and maintains one of the highest MSEP ratings in the 97th BMW.

Missile Maintenance

Sgt Dale A. Hoyle, 351 SMW, Whiteman AFB, is SAC ICBM Maintenance Airman of the Month. While assigned to the RV Branch, Sgt Hoyle was the only individual qualified to perform maintenance on all three entry vehicle systems: the MK 11C Reentry Vehicle, the Emergency Rocket Communication System (ERCS) Payload, and the MK 1A Penetration Aid. He also assisted in rewriting a major portion of an ERCS maintenance technical order as well as revising even detailed lesson plans concerning RV and ERCS test and handling equipment. His training program standardized the levels of knowledge, doubled the quality of maintenance production, and immeasurably aided in the upkeep of over 200 pieces of maintenance test and support equipment. Sgt Hoyle completely retooled the ERCS maintenance bay by ordering over 200 tools and creating two consolidated tool kits. This improvement allows two ERCS maintenance tasks to be performed simultaneously.

PROFESSIONAL PERFORMERS

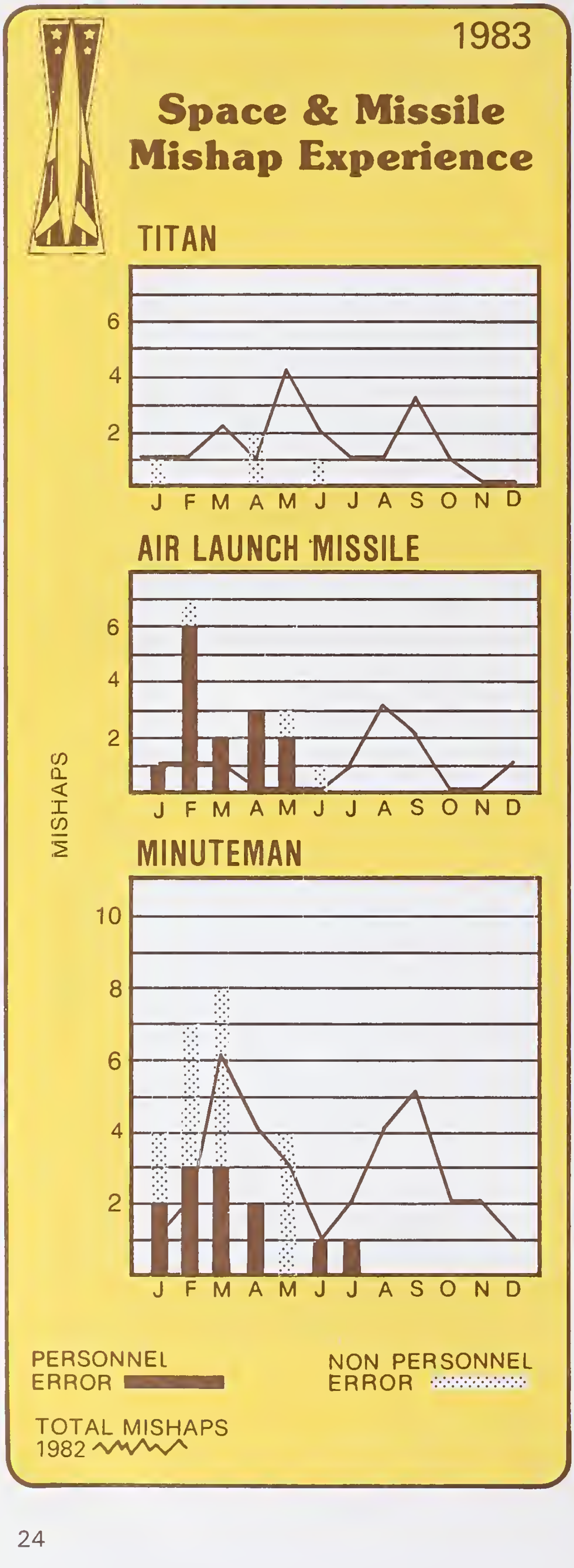
Missile Crew

The 308 SMW Crew E-082: Capt Don Tatum, MCCC; 2Lt Gerald McNair, DMCCC; SrA Gary Whitt, MSAT; and Sgt Mark Dietz, MFT, is SAC Missile Crew of the Month. Crew E-082 demonstrated superior weapon system knowledge, safety consciousness and poise under pressure during a fire hazard on one occasion and a diesel malfunction on another. The fire hazard occurred when the power supply unit on the MGACG failed. During trouble analysis the crew noticed smoke coming from the unit. With indications of a fire in the electrical circuitry, the crew quickly isolated the component, deactivated the affected circuitries and shut the system down. The diesel problem occurred during the ordnance connect phase of the PTS operation. With six maintenance personnel in the launch silo connecting ordnance to the missile, the complex lost commercial power and the diesel failed to start automatically. Crew coordination was superb as the DMCCC safely directed the evacuation of personnel from the silo while the MCCC, MSAT and MFT implemented the appropriate hazard checklist. They successfully troubleshot the problem, started the diesel and restored AC power to the complex, enabling maintenance activity to continue with minimum delay.

Flying Crew

Crew R-33, 96 BMW, Dyess AFB: Capt Rod Templeton, P; 1Lt Tom Klaine, CP; Maj John Bouchard, RN; 2Lt William L. Bernard, N; 2Lt Daniel J. Lucis, EW; and Sgt David R. King, G; are SAC's Flying Crew of the Month.

Crew R-33 were recently flying their B-52H on a low level BUY NONE mission. During the first of three planned bomb runs, the right body hydraulic system lost pressure. Normal extension of the right main landing gear was lost. After completing the three bomb runs and during climbout from low level, number four engine oil pressure began to drop. As the pressure dropped from 40 psi to 2 psi, the engine began to vibrate and Capt Templeton shut down the engine. Due to the previous loss of right body hydraulics, a successful extension of the four main landing gear depended solely on the windmill hydraulic pressure provided by the vibrating number four engine and a standby pump. Capt Templeton declared an emergency and diverted to Ellsworth AFB, 30 minutes away. Extension of the two left main gear and emergency extension of the right forward gear were accomplished through windmill pressure from number four engine. The right aft gear extended on standby pump pressure. With all gear successfully extended, Capt Templeton landed the aircraft without incident. Postflight investigation by maintenance personnel revealed that the number four engine would most likely have seized completely in another 20 minutes. In addition, a leak in the left body hydraulic system was discovered which would have rendered that system totally inoperative in 30 minutes. With this total failure of the left hydraulic system, it would not have been possible to lower the front main landing gear, resulting in the loss of the aircraft.


1983

Space & Missile Mishap Experience

TITAN

AIR LAUNCH MISSILE

MINUTEMAN

Well Done!

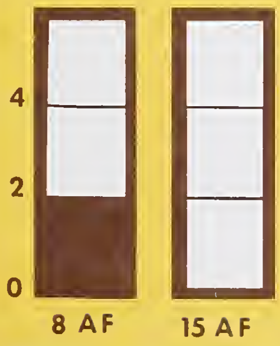
On 13 December 1982, Maj James W. O'Neal departed Andersen AFB, Guam on a high altitude ferry flight in a U-2R. Two hours into the mission the aircraft air conditioning system malfunctioned causing loss of cabin heating. The cockpit temperatures dropped rapidly due to extremely cold ambient temperatures at the mission altitude. Maj O'Neal's investigation of the problem revealed an open circuit breaker that would not reset. He was now in a mission abort situation facing extensive exposure to high altitude sub zero temperatures due to the peculiar descent profile from altitude in the U-2. Already feeling the effects of exposure, Maj O'Neal's problems compounded as numerous circuit breakers began to open during the descent and recovery to Guam, generating an increasingly serious electrical malfunction and subsequent loss of vital aircraft systems. In a matter of minutes, Maj O'Neal lost the use of aircraft trim, lift spoilers, roll spoilers, flaps, speedbrakes, DC generators and associated aircraft systems, plus he was indicating an unsafe tailgear. His descent profile was greatly prolonged due to the loss of drag devices for descent. Maj O'Neal attempted to declare his emergency and discovered that his HF radio was also inoperative. Meanwhile, the canopy froze over and increasing numbness of his hands and feet began to affect his ability to perform in the cockpit. He continued to descend back toward Guam and eventually made radio contact once within UHF range. Maj O'Neal carefully analyzed his situation. Landing would be a severe challenge without the integral control devices critical to precise aircraft control. The unsafe tailgear indication would require visual gear down confirmation before landing could be attempted. Descent continued as cockpit temperatures now stabilized well below freezing. As the aircraft reached lower and warmer altitudes, Maj O'Neal experienced little relief as the cockpit and his pressure suit were cold-soaked. He found aircraft control increasingly difficult as the forces on the controls exceeded a sustained 35 pounds in the final phases of flight. Maj O'Neal completed the descent and arrived at Andersen for a low approach. His gear was reported safely down and he executed a flawless no-flap straight-in approach while maintaining airspeed within a critical two-knot approach window. Touchdown was successful but the recovery was still aggravated by inoperative wheel brakes. The aircraft was successfully brought to final rest on the runway after a seemingly interminable landing rollout.

SAC'S TEN YEAR FLYING SAFETY RECORD

CLASS A FLIGHT MISHAPS

YEAR	73	74	75	76	77	78	79	80	81	82	83
TOTAL MISHAPS	5	8	4	4	4	1	5	4	4	2	2
FLYING HOURS 100,000	6.1	5.1	4.2	3.9	3.7	3.6	3.6	3.4	3.5	3.5	1.7
FATALITIES	0	14	7	22	10	5	7	2	14	9	7
RATE	.82	1.6	1.0	1.0	1.1	.28	1.4	1.2	1.2	.58	.65*

*Estimated Rate based on 310,000 Flying Hours



28496

JUNE FLYING HOURS

165231

1983 FLYING HOURS

APRIL	B-52G
JUNE	FB-111A

1983 MISHAP STATS

continued from page 19

tual situation, it could take some time for the hydraulic pressure to build up. The objective of this step is to make sure the gear does not unlock. In addition, the gear doors may close very slowly or may not close at all. Step 9 (the last step) is critical, so know the requirement and how you fit into the overall maneuver.

The elapsed time from when you were cleared by the pilot to lower the gear until completion of the procedure should be approximately two minutes.

I hope this article has answered a few of the questions you may have had. Hopefully, it has made you curious enough to review the entire procedure for landing gear emergency extension. If it makes your crew get together and discuss the procedure that's even better. The checklist, condensed and amplified, must be completely understood and practiced in order for you to manually extend the gear effectively and without hesitation.

Aircraft commanders, you may want to take the time to practice the procedure with your crew to gain confidence that your nav and boom can quickly and effectively lower the gear because they are proficient. After all, it is part of "flying the airplane."

PINPOINT BOMBING

This target pole at a Tonopah test bed was almost obliterated a few years ago by a B-53 bomb dropped by a B-52F. (Thanks to Capt James Wright, 60 BMS)

AFIT Strategic and Tactical Sciences Program

Needed — Officers with both operational and technical backgrounds.

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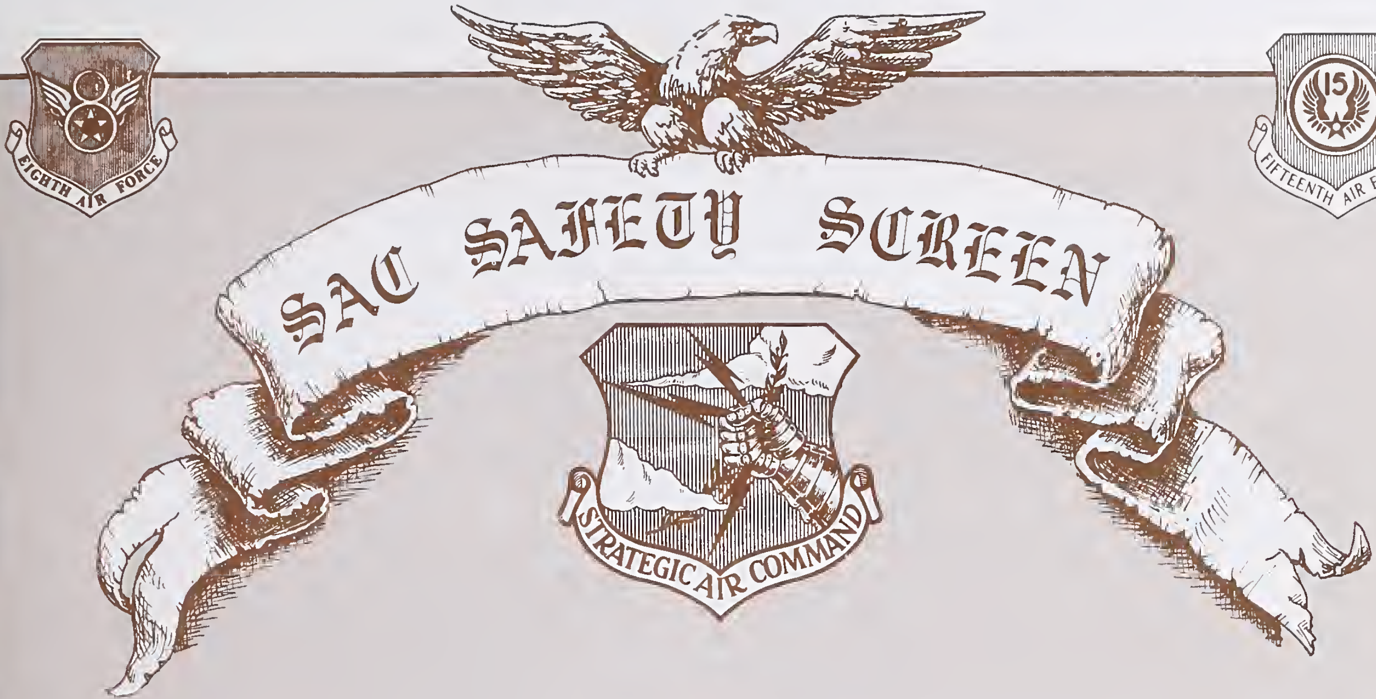
The S & TS program is offered at the Air Force Institute of Technology (AFIT) School of Engineering and leads to a degree of Master of Science in Operations Research. This 18-month program emphasizes quantitative scientific approaches to strategic and tactical operations planning. Specifically, you'll study probability and statistics; operations research; nuclear and conventional weaponry; electronic warfare; and command, control and communications.

As a S & TS graduate, you'll qualify for positions in studies and analysis, plans, operational analysis, strategic targeting, simulation and analysis, and many more. In fact, SAC has 45 positions for S & TS graduates at Offutt AFB. These requirements include positions on both the SAC Headquarters Staff and the Joint Strategic Target Planning Staff. 14XX, 22XX, 28XX, 51XX, and 80XX AFSCs are needed. The 1st Strategic Aerospace Division at Vandenberg AFB also has three 1835 slots.

For more information on the S & TS program, call Major Bob Summers, HQ SAC point of contact, SACOS/XOBM at autovon 271-4474/4784.



SAC SAFETY SCREEN

93 AREFS, Castle Crew IT-56: IP Capt Mark R Johnson, IN Capt James Smith, IBO TSgt Larry S Strong

337 BMS, Dyess Crew E-33: P Capt Rodney G Templeton, CP 1Lt Thomas A Klaine, CP 2Lt Charles D Sutherland, BN Maj John P Bouchard, NN 2Lt William J Bernard, NE 2Lt Daniel J Lucis, AG Sgt David R King

917 AREFS, Dyess Crew R-120: P Capt John E Conrad, CP 1Lt James J Greenough III, NN 1Lt Timothy G Vaughan, IBO SSgt James C Hall

22 AREFS, March Crew R-124: FP Maj Daniel J Bohlin, CP 1Lt Holly T Wong, NN Capt Herbert H Henderson, BO Sgt Dale D Martin

22 AREFS, March Crew R-131: FP Capt Frank G Showalter III, CP 1Lt Paul C Soper, NN 1Lt Dana N Willis, BO SSgt Robert I Morales

91 AREFS, McConnell Crew E-106: P Capt David Valenta, CP 1Lt Susan Fairchild, N 1Lt Terry Hale, BO SSgt Marc Aalderink

384 AREFS, McConnell Crew E-161: P Capt David Legard, CP 1Lt Kenneth Randolph, N 2Lt David Schneider, BO Sgt Terry Dover

920 AREFS, Wurtsmith Crew R-131: AC Capt Ernest G Magliemont, CP Capt Thomas B McDerby, NN 2Lt Hunter K Johnson, BO Sgt William D Arnold

920 AREFS, Wurtsmith Crew R-145: AC Capt Richard C Legas, CP 1lt Danny P Pegram, NN 1Lt Vickie L Giddens, BO Sgt Eric Merriweather

380 AREFS, Plattsburgh Crew E-111: P Capt Marcus J Lane, CP Capt Thomas H Meglasson II, N 2Lt Scott J Ogden, BO Sgt Michael A Chmiel

305 AREFS, Grissom Crew E-131R: P Capt Rex Chlagenhauf, CP 1Lt Mike Gee, IN Capt Terry Cisna, BO SSgt Dave Osburn

70 AREFS, Grissom Crew R-162R: IP Maj Fran Goelz, CP Capt Jim VanNess, N 1Lt Joe Kiple, BO Sgt Larry Greenfield

24 SRS, Eielson Crew E-03: P Capt Samuel R Torrey, CP Capt Richard T Davis, N1 Maj Terry L Conkright, N2 Capt William G French

24 SRS, Eielson Crew E-14: TC Capt David M Trask, R-1 1Lt Brian C Bergdahl, R-2 Capt Charles W Gill, R-4 Capt Terry L Bunas, MT Capt William D Wright, PT SSgt Blair A Brandrup, ET SSgt William W Bruens

9 AREFS, March Crew 4X: FP Capt Leo A Brownyard, CP Capt John W Bronk, FE TSgt Archie C Moore, BO MSgt Andrew D Miller Jr.

43 SW, Andersen Crew E-31: AC Capt James F Shanley Jr, CP 1Lt Peter J Katsufrakis, RN Capt Edward J Sweeney, NN Capt Robert C Olmstead, EW Capt Paul E Lukehart, AG SSgt John P Denzer

43 SW, Andersen Crew R-15: P Capt Stephen A Himber, CP 1Lt David T Smith, RN Capt Monty J Valentine, NN 1Lt James E Edge, EW 1Lt Bradley T Merry, AG TSgt Carl F Gohn

128 ARG, Gen Mitchell Fld, Milwaukee, WI: P Lt Col Donald L Rosborough, IP Maj Donnie R Thompson, N 1Lt Rod M Langford, BO TSgt John T Sands

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FLARE